

AD

Positioning assembly for a ram head

Patent number: EP0984105
Publication date: 2000-03-08
Inventor: RASMUSSEN FINN (DK)
Applicant: AARSLEFF AS (DK)
Classification:
 - **International:** E02D13/10
 - **European:** E02D13/10
Application number: EP19980610031 19980831
Priority number(s): EP19980610031 19980831

Also published as:

- EP0984105 (B1)
- DE69813796T (T2)
- DE69813796D (T2)

Cited documents:

- EP0392311
- US2931186
- US4479552

Abstract of EP0984105

A positioning assembly (106) for a ram head (336) has a top surface for receiving impact pulses produced by a ram mechanism and a bottom surface for transmitting said impact pulses to a pile (102) with the purpose of driving said pile (102) into the ground or into a similar surface. The assembly comprises:

a first part and a second part. The first part defines an inner space for receiving said ram head (336) and exposing said top and bottom surfaces thereof and allowing said ram head (336) to transmit said impact pulses from said ram mechanism to said pile (102). The first part further has blocking means (342) for preventing said ram head (336) from being separated from said first part, and is fixatable to said ram mechanism.

The second part (330) is journalled rotatably relative to the first part round an axis of rotation, which is substantially coinciding with the longitudinal axes of said ram head (336) and of said pile (102).

The second part (330) further has fixation means for fixating said pile (102) in a specific and fixed rotational relationship relative to said second part (330). The assembly further comprises motor-drive means (300) co-operating with the first and second parts and has a first operational mode and a second operational mode.

The motor-drive means (300) generates in the first operational mode a rotational motion of said second part (330) relative to said first part round said axis of rotation, and generates in said second operational mode a fixation of said second part (330) relative to said first part preventing said second part from rotating relative to said first part round said axis of rotation.

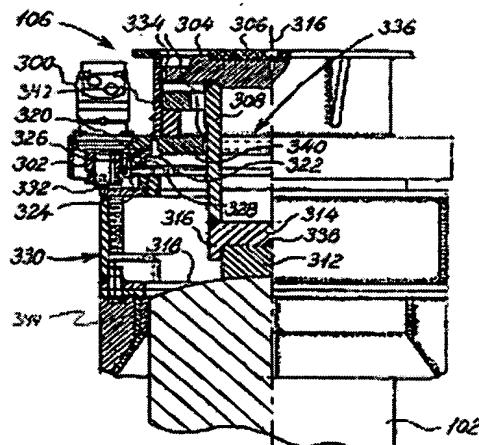


Fig. 3

Data supplied from the esp@cenet database - Worldwide

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 0 984 105 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
08.03.2000 Bulletin 2000/10

(51) Int Cl.7: E02D 13/10

(21) Application number: 98610031.1

(22) Date of filing: 31.08.1998

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE

Designated Extension States:
AL LT LV MK RO SI

(71) Applicant: PER AARSLEFF A/S
DK-8230 Aabyhoej (DK)

(72) Inventor: Rasmussen, Finn
8381 Mundelstrup (DK)

(74) Representative: Nielsen, Henrik Sten
Budde, Schou & Ostensfeld A/S
Vester Sogade 10
1601 Copenhagen V (DK)

(54) Positioning assembly for a ram head

(57) A positioning assembly (106) for a ram head (336) has a top surface for receiving impact pulses produced by a ram mechanism and a bottom surface for transmitting said impact pulses to a pile (102) with the purpose of driving said pile (102) into the ground or into a similar surface. The assembly comprises: a first part and a second part. The first part defines an inner space for receiving said ram head (336) and exposing said top and bottom surfaces thereof and allowing said ram head (336) to transmit said impact pulses from said ram mechanism to said pile (102). The first part further has blocking means (342) for preventing said ram head (336) from being separated from said first part, and is fixatable to said ram mechanism.

The second part (330) is journaled rotatably rela-

tive to the first part round an axis of rotation, which is substantially coinciding with the longitudinal axes of said ram head (336) and of said pile (102).

The second part (330) further has fixation means for fixating said pile (102) in a specific and fixed rotational relationship relative to said second part (330). The assembly further comprises motor-drive means (300) co-operating with the first and second parts and has a first operational mode and a second operational mode.

The motor-drive means (300) generates in the first operational mode a rotational motion of said second part (330) relative to said first part round said axis of rotation, and generates in said second operational mode a fixation of said second part (330) relative to said first part preventing said second part from rotating relative to said first part round said axis of rotation.

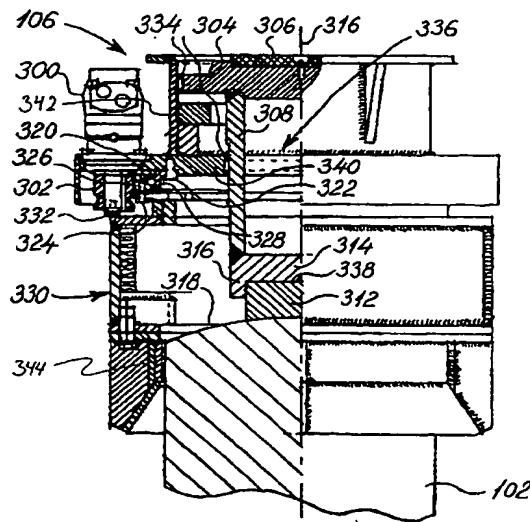


Fig. 3

Description

[0001] The present invention relates to a positioning assembly for a ram head receiving impact pulses produced by a ram mechanism and transmitting the impact pulses through an impact piece and into the top surface of a pile with the purpose of driving the pile into the ground allowing a variable orientation about the longitudinal axis of the pile.

[0002] Pile-driving is a well known technique for placing many different forms of foundations in the ground. Piles are today often made of concrete and are often produced under industrial conditions in a factory, and very effective machinery for pile-driving is available nowadays, so that the driving can be carried out quickly and effectively on site. Modern pile-drivers are provided with a hammer assembly, or ram, and a slide guide, called the leader, which is arranged along the pile-driving direction, for example vertically or almost vertically. A modern and very effective hammer assembly comprises an elongate unit being placed on top of the pile in extension of the axis thereof, which unit by means of hydraulically supplied power throws an internal weight upwards and allows it to drop in order to perform the ramming. The hammer assembly follows the pile downwards during the ramming, so that the drop height and frequency of the weight need not be dependent on the actual driving depth of the pile. The pile top must, of course, be guided in relation to the hammer assembly, so that the pile is hit squarely on the top, and this is suitably achieved by means of a sort of holding mechanism arranged in the form of a so-called ram head. Normally, an intermediate plate or impact piece is placed between the hammer mechanism and the pile top, said intermediate plate or impact piece being of a material such as for example wood or plastic which may, to some degree, cushion the blows.

[0003] A ram head of a versatile structure and including a number of advantageous features is described in European patent no.: EP 0 392 311 A1, to which reference hereby is made. The ram head includes means for positioning the ram head relative to the pile and further means for rotating the ram head about an axis parallel to the longitudinal axis of a pile in 14 different orientations at intervals of 7.5°, over an angular region of totally 105°. The rotary orientation is fixed by means of two bushings inserted into two plug holes.

[0004] EP 0 392 310 A2 and EP 0 392 309 A2 to which reference hereby is made, comprising machines for pile-driving and methods for transport and erection of a machine for pile-driving further describes the conventional pile-driving techniques.

[0005] Experience from using conventional technique shows that usage of bushings to secure a rotary orientation of the ram head, is a slow and complicated process. Manually inserting and extracting the bushings is time consuming and hard physical labour. Therefor there is a need for an improved pile-driving technique to

speed up and simplify the process of positioning the piles before performing the pile-driving.

[0006] An object of the present invention is to provide a positioning technique for a ram head enabling arbitrary and continuous rotation of a pile hoisted above the ground or a similar surface, providing an accurate angular positioning about an axis parallel to the longitudinal length of the pile.

[0007] A feature of the present invention relates to the fact that an arbitrary rotation, as provided according to positioning technique according to the present invention, insures the correct angular position of the pile relative to an axis parallel to the longitudinal length of the pile.

[0008] A particular advantage of the present invention relates to the fact that the positioning technique according the present invention allows operation at faster speeds as compared to a conventional rotational positioning system. The hard manual work endured in conventional technique is made redundant hence the overall working conditions are improved.

[0009] The above object, feature and advantage together with numerous other objects, features and advantages, which will be evident from the below detailed description of the preferred embodiments of the positioning assembly according to the present invention are obtained in accordance with a first aspect of the present invention by a positioning assembly according to the present invention, comprising:

30 a first part and a second part,
said first part defining an inner space for receiving
said ram head and exposing said top and bottom
surfaces thereof and allowing said ram head to
transmit said impact pulses from said ram mecha-
nism to said pile,
said first part having blocking means for preventing
said ram head from being separated from said first
part,
said first part being fixatable to said ram mecha-
nism,
said second part being journaled rotatably relative
to said first part round an axis of rotation, said axis
of rotation being substantially coinciding with the
longitudinal axes of said ram head and of said pile,
said second part having fixation means for fixating
said pile in a specific and fixed rotational relation-
ship relative to said second part,
motor-drive means co-operating with said first and
second parts and having a first operational mode
and a second operational mode,
said motor-drive means generating in said first op-
erational mode a rotational motion of said second
part relative to said first part round said axis of ro-
tation, and
said motor-drive means generating in said second
operational mode a fixation of said second part rela-
tive to said first part preventing said second part

from rotating relative to said first part round said axis of rotation.

[0010] Implementing motor-drive positioning means provides a feature of the present invention relating to the fact that rotation and angular fixation of a pile around an axis parallel to the longitudinal length of the pile is significantly simplified. Furthermore an advantage relates to the fact, that the motor-driving means can perform an arbitrary and continuous angular rotation of the pile, having an enhanced angular resolution of the rotation. This fact further increases the pile positioning accuracy of the pile-driving apparatus.

[0011] The motor-drive means can comprise a motor, such as a combustion driven, a hydraulic driven, a pneumatic driven, or preferably an electric driven motor, and a transmission comprising a chain drive, a belt drive, a cardan drive, a gear drive or any combinations thereof, and defining a ratio of transmission from said motor to said second part. The combustion driven engine can be driven by coal, diesel, petrol, methane, hydrogen or other types of fossil fuels. The hydraulic driven motor can be driven by water pressure or oil pressure. The pneumatic driven motor can be driven by air or gas pressure. The electric motor can be driven voltage or current being DC or AC having pulses or continuous square, triangular or sinusoidal shaped waves.

[0012] The transmission ratio can be within the range 0.01 to 0.5, including the range 0.05 to 0.25. The transmission between the motor and the second part can comprise a gear drive with primary gear wheel and a secondary gear wheel, respectively. The secondary gear wheel can have teeth protruding in an overall inward direction relative to the axis of rotation or can have teeth protruding in an overall outward direction relative to the axis of rotation. The primary gear wheel can comprise teeth protruding in an overall outward direction relative to axis of the driving shaft. Either form of teeth or drive will provide the positioning assembly with numerous advantages. For example having the teeth protruding inward on the second part protects the gear drive from dirt accumulating in the space between the teeth. Having the teeth protruding in an outward direction on the second part, the transmission between first and second part is somewhat simplified, because the teeth are facing the motor.

[0013] The first operational mode of the motor-drive means generates the rotational motion being arbitrary and continuous by gradually rotating the driving shaft of the motor causing through the transmission secondary part to rotate. However, the motor-drive means can further comprise braking means to be inactive in the first operational mode and active in the second operational mode for fixating the second part relative to the first part preventing the second part from rotating relative to the first part round the axis of rotation. The motor-drive means can utilise in the second operational mode an inherited braking effect constituted by an initial braking

torque of the motor. The braking means can further comprise brakes acting on the driving shaft of the motor thereby increasing the initial torque of the motor, and can be implemented by mechanical, electric and/or magnetic braking means or any combinations thereof.

[0014] The motor of the motor-drive means can be mounted on the first part, or alternatively to the second part, thereby allowing for a variety of customisations of the positioning assembly.

5 **[0015]** In this context the terms upper, lower, top and bottom relate to the situation when the pile-driving apparatus is operational in a pile-driving action.

[0016] The first part can further comprise a groove for the insertion of a corrosion and wear resisting material, such as PE, PP, PVC or any other types of plastic, as guidance for the ram head, hence extending life-span on positioning assembly significantly. Alternatively, the first part can be produced from one of the above materials.

10 **[0017]** The fixation means can comprise a housing defining an inner surface or surfaces to be arranged in co-planar relationship with the outer surface or surfaces of the pile. Alternatively the housing can comprise a inner surface or surfaces being substantially in co-planar

15 relationship with the outer surface or surfaces of the pile, having an inner surface or surfaces tapering inward relative to the axis of rotation. Hereby a simple and easy method for guiding the pile into the housing is provided.

[0018] The housing can comprise, on the inner surface or surfaces, sheets of a corrosion and wear resisting material, such as PE, PP, PVC or any other type of plastic. Hereby the protection of the fixation means on the second part is increased considerably and hence the life-span of the housing is increased.

20 **[0019]** The fixation means can be glued, welded or preferably bolted to the second part. Even though fixation means, such as mentioned in EP 0 392 311 A1, provide an easy and quick fixation of a wide variety of pile types, the fixation means of the positioning assembly of

25 the present invention enables an improved fixation for a wide variety of pile types having any shape by bolting any pile fitting housing on the second part.

[0020] The first part can be arranged above the second part, the first part being fixed to said ram mechanism. Alternatively, the first part may arranged below the second part. The second part including the pile fixating means can swivel or rotate around the axis of rotation having the pile fixed to the housing mounted to the second part.

30 **[0021]** The blocking means can comprise a circumferential ring protruding inwardly from the first part into the inner space thereof. The blocking means prevent the ram head from separating from the first part thereby insuring that the ram head stays within the inner space of the positioning assembly even when no pile is mounted on the second part.

[0022] The above objects, the above advantages and the above features, together with numerous other ob-

jects, advantages and features which will be evident from the below detailed description of a presently preferred embodiment of the present invention, are obtained, according to a second aspect of the present invention, by a ram head assembly comprising:

a ram head having a top surface for receiving impact pulses produced by a ram mechanism and a bottom surface for transmitting said impact pulses to a pile preferably through an impact piece with the purpose of driving said pile into the ground or into a similar surface,
 a positioning assembly housing:
 a first part and a second part,
 said first part defining an inner space for receiving said ram head and exposing said top and bottom surfaces thereof and allowing said ram head to transmit said impact pulses from said ram mechanism to said pile,
 said first part having blocking means for preventing said ram head from being separated from said first part,
 said first part being fixatable to said ram mechanism,
 said second part being journaled rotatably relative to said first part round an axis of rotation, said axis of rotation being substantially coinciding with the longitudinal axes of said ram head and of said pile, said second part having fixation means for fixating said pile in a specific and fixed rotational relationship relative to said second part,
 motor-drive means co-operating with said first and second parts and having a first operational mode and a second operational mode,
 said motor-drive means generating in said first operational mode a rotational motion of said second part relative to said first part round said axis of rotation, and
 said motor-drive means generating in said second operational mode a fixation of said second part relative to said first part preventing said second part from rotating relative to said first part round said axis of rotation.

[0023] The ram head assembly according to the second aspect of the present invention basically includes a positioning assembly according to the first aspect of the present invention, which positioning assembly, constituting a component of the ram head assembly according to the second aspect of the present invention, may be implemented in accordance with any of the above features of the positioning assembly according to the first aspect of the present invention. Furthermore, the ram head assembly according to the second aspect of the present invention provides an accurate hammering effect on the pile and provides an arbitrary and continuous rotation of the pile such as to obtain an accurate positioning of the pile relative to an axis of rotation.

[0024] According to a particular embodiment of the ram head assembly according to the second aspect of the present invention, the ram head is integrated with the first part, alternatively, the ram head can be integrated with the second part.

5 [0025] The above objects, the above advantages and the above features, together with numerous other objects, advantages and features which will be evident from the below detailed description of a presently preferred embodiment of the present invention, are obtained by a third aspect of the present invention, by a method for motor-driven rotation and angular fixation of a pile around longitudinal axis of the pile by means of a positioning assembly comprising the following steps:

10 15 insuring said pile in said positioning assembly, initiating said motor-drive means in said first operational mode hereby rotating said pile around said axis of rotation, and
 20 initiating said motor-drive means in said second operational mode hereby insuring said pile in a fixed angular orientation.

25 [0026] The method for motor-driven rotation and angular fixation of a pile around longitudinal axis of the pile in accordance with a third aspect of the present invention can be implemented by means of the positioning assembly in accordance with the first aspect of the present invention may involve any of the above mentioned motor-driven means for providing first and second operational mode.

30 [0027] The above objects, the above advantages and the above features, together with numerous other objects, advantages and features which will be evident from the below detailed description of a presently preferred embodiment of the present invention, are obtained by a fourth aspect of the present invention, by a method for motor-driven rotation and angular fixation of a pile around longitudinal axis of said pile by means of 35 a ram head assembly comprising the following steps:

40 45 insuring said pile in said ram head assembly, initiating said motor-drive means in said first operational mode hereby rotating said pile around said axis of rotation, and
 initiating said motor-drive means in said second operational mode hereby insuring said pile in a fixed angular orientation.

50 [0028] The method for motor-driven rotation and angular fixation of a pile around longitudinal axis of said pile in accordance with a fourth aspect of the present invention can be implemented by means of the ram head assembly in accordance with the second aspect of the present invention and may involve any of the above mentioned motor-driven means for providing first and second operational mode and can include a ram head being rotatable relative to the first and second part

of the positioning assembly in accordance with the first aspect of the present invention.

[0029] The present invention will now be further described with reference to the drawings, in which

[0030] Figure 1 is a schematic illustration of a pile-driving apparatus according to the invention, shown from the side, as transported on a railway track.

[0031] Figure 2 is a schematic illustration of a pile-driving apparatus according to the invention, shown from the top, as transported on a railway track.

[0032] Figure 3 is a schematic illustration of a section of the positioning assembly including a ram head within, shown in side view, providing the turning action of the pile-driving apparatus.

[0033] Figure 4 is a schematic illustration of a section of the positioning assembly without a ram head, shown in top view, providing the turning action of the pile-driving apparatus.

[0034] As illustrated in figure 1, the pile-driving apparatus, designated by numeral 100 in its entirety, comprises three essential sections. A driving carriage, designated by numeral 124 in its entirety, allows for movement in a co-planar relationship with a supporting surface e.g. ground surface. The co-planar movement is achieved by driving normal track rubber wheels 114 or by railway track wheels 116 on the supporting surface. When the pile-driving apparatus is performing a pile-driving action, the normal track wheels 114 or railway track wheels 116 are suspended above the supporting surface by hydraulic lifts 118, this insures the pile-driving apparatus 100 from slipping or shifting from an original position hence maintaining a substantially fixed positioning of a pile 102 and avoiding an substantial slanting of the pile 102 relative to the supporting surface 112. A rotatable upper part, designated by numeral 122 in its entirety, allows for movement around an overall vertical axis, denominated the primary swivel axis so that it may swivel relative to the driving carriage 124. A hammer assembly, designated by numeral 126 in its entirety, provides a ramming action of the pile-driving apparatus 100.

[0035] The hammer assembly 126 is fitted with a slide guide 128 for a ram mechanism, designated by numeral 110 in its entirety, a first hoist, not shown in figure, for hoisting the ram mechanism 110 and second hoist, not shown in figure, for hoisting the pile 102. In the preferred embodiment of the present invention the first hoisting is provided through the use of a cable 120 and second hoisting through the use of a cable 130 rolled onto wheels, not shown in the figures. Furthermore the hammer assembly 126 is being adapted to erection into substantially vertical operational position for the purpose of pile-driving, and to lowering into substantially horizontal transportation position for the purpose of relocating the pile-driving apparatus 100 by hydraulic means 136.

[0036] In the preferred embodiment of the present invention the ram mechanism 110 comprises a weight 112 and a positioning assembly 106 for a ram head. The

weight 112 is lifted up and released from a maximum vertical position sliding along the slide guide 128 achieving an accurate and therefor safe ram onto the ram head situated within the positioning assembly 106. The positioning assembly 106 provides fixation for the pile 102 and provides a possible rotation about a vertical axis hence obtaining a secondary pivotable axis giving an optional parallel displacement of the pile 102.

[0037] Figure 2 illustrates the pile-driving apparatus 100 on a set of railway tracks 200 having the pivotable upper part 122 turned an angle with respect to the tracks 200. This illustrates a normal working mode of the embodiment of the present invention. The upper part 122 is swivelled to a position on one the side of the railway tracks 200 for the ramming of one pile 102 into the ground or supporting surface. The secondary pivotable motion allows the pile 102 to be positioned at any distance from the tracks 200 and provides a final fine scale adjustment possibility before the ramming is initiated.

[0038] Figures 3 and 4 are illustrating the positioning assembly 106 of a first and presently preferred embodiment of present invention having a ram head, designated by numeral 336 in its entirety, within, and showing here the positioning assembly 106 in two views. Figure 3 illustrates the side view and shows an upper part defined as a first part and a lower part defined as a second part. An electrical motor 300 is bolted to a bottom plate 340 on the first part of the positioning assembly 106 having a primary gear wheel 302 secured by a bolt 332 to the driving shaft of the electric motor 300. The primary gear wheel 302 is driving a secondary gear wheel 326 secured by a bolt 324 to a rotatable section or the second part, designated by numeral 330 in its entirety, of the positioning assembly 106. This arrangement provides an arbitrary and continuous 360° motor-driven rotation around a vertical axis 316 for the correct positioning of the pile 102 having a angular resolution within the range 0.1°-5°, including the range 0.5°-1°. Implementing a motor-driven rotation according to the present invention provides tremendous advantages to conventional rotational means. Firstly the angular resolution is improved tenfold and secondly the positioning adjustments can be performed and checked and further corrected consecutively by stopping and starting the electric motor 300. This feature reduces working procedures significantly. Alternative embodiments of the driving of the pivotal section 330 of the positioning assembly 106 can include belt drive, cardan drive or chain drive, but by using gear wheels directly, as presently preferred in the first embodiment of the present invention, play in the rotation is minimised.

[0039] The rotatable section 330 is journaled on the bottom plate 340 on the first part of the positioning assembly 106 by using a circumferential slide bar 320 on the secondary gear wheel 326 on the rotatable section 330. A fitting circumferential slide grip 328 is fitted to the circumferential slide bar 320 and is bolted with a bolt 322 to the bottom plate 340 on the first part of the posi-

tioning assembly 106.

[0040] The rotatable section 330 embraces the pile 102, which in this case, shown in figure 3 and 4, is rectangular in shape with a curved pile top 318. The interior of the rotatable section 330 of the first and presently preferred embodiment of the present invention has additionally wear and corrosion resisting patches 320 of materials such as PE, PP, PVC or any other type of plastic insuring firm contact between the pile 102 and the rotatable section 330 and providing protection from the pile 102. Situated above the pile top 318 in the interior of the positioning assembly 106 of the ram mechanism 110 is a vertically movable ram head 336, which comprises a bottom plate 314 facing an intermediate plate or an impact piece 312 inter-imposed between the pile top 318 and bottom plate surface 338, the impact piece 312 being of wood preferably oak, or synthetic material PE, PP, PVC or any other type of plastic. The bottom plate 314 is provided with a downwardly extending collar 316 enclosing the impact piece 312. This collar 316 serves the purpose not only of holding the impact plate 312 in its non-deformed shape, but also of holding the impact piece 312 within its limits, even in the case of a severe deformation thereof. It is hereby achieved that the impact impulses are only acting on the central area of the pile top, and not near the top edges of the pile 102. Experiments have shown that hereby the pile 102 may be driven without any damage of the top edges, if only the impact piece 312 is of a suitable thickness and the length of the collar 316 is adapted thereto, for example half the thickness of the impact piece 312. The collar 316 may have the form of any closed, or substantially closed, outline, but preferably it is rectangular or circular.

[0041] The ram weight 112 acts on a top impact plate 306 being firmly mounted on top of a horizontal top section 304 of the ram head 336 which transmits the impact impulse to the bottom plate 314 through the body 308 being in the form of a preferably cylindrical tube having three outer diameters stepping from having the greatest diameter at the horizontal top section 304 to the smallest diameter at the bottom plate 314, all diameters of the body 308 are smaller than the horizontal top section 304. The top impact plate 306 can be wood preferably oak, synthetic material such as PE, PP, PVC or any other plastic, or in the first and presently preferred embodiment of the present invention metal, preferably lead. A smooth vertical and angular movement of the ram head 336 is achieved through the positioning assembly 106 by the insertion of circumferentially wear and corrosion resisting rings 334 of materials such as PE, PP, PVC or any other plastic, in circumferential grooves on the top plate 304 of the ram head 336 and the bottom plate 340 on the first part of the positioning assembly 106. The positioning assembly 106 comprises blocking means preventing the separation of the ram head 336 from the first part of the positioning assembly 106. This is accomplished by an inner diameter of the bottom plate 340,

greater than the two smallest outer diameters of the body 308, but smaller than the greatest outer diameter of the body 308 being situated closest to the top horizontal section 304 of the ram head 336, furthermore an extra securing circumferential ring 342 is positioned such as to prevent direct contact between the top horizontal section 304 and the bottom plate 340.

[0042] Figure 4 is illustrating the top view of the first and presently preferred embodiment of the positioning assembly 106 according to present invention. The rectangular shape of the rotatable section 330 embracing the rectangular shaped pile 102. The rotational motion can be directed clockwise or counter clockwise in an arbitrary and continuous movement and hereby achieving a fine resolution in the adjustment and readjustment of the pile 102 and an accurate angular positioning.

Claims

1. A positioning assembly for a ram head having a top surface for receiving impact pulses produced by a ram mechanism and a bottom surface for transmitting said impact pulses to a pile preferably through an impact piece with the purpose of driving said pile into the ground or into a similar surface, comprising:
a first part and a second part,
said first part defining an inner space for receiving said ram head and exposing said top and bottom surfaces thereof and allowing said ram head to transmit said impact pulses from said ram mechanism to said pile,
said first part having blocking means for preventing said ram head from being separated from said first part,
said first part being fixatable to said ram mechanism,
said second part being journaled rotatably relative to said first part round an axis of rotation, said axis of rotation being substantially coinciding with the longitudinal axes of said ram head and of said pile,
said second part having fixation means for fixating said pile in a specific and fixed rotational relationship relative to said second part,
motor-drive means co-operating with said first and second parts and having a first operational mode and a second operational mode,
said motor-drive means generating in said first operational mode a rotational motion of said second part relative to said first part round said axis of rotation, and
said motor-drive means generating in said second operational mode a fixation of said second part relative to said first part preventing said second part from rotating relative to said first part round said axis of rotation.

2. The positioning assembly according to Claim 1, said motor-drive means comprising a motor, such as a combustion driven, a hydraulic driven, a pneumatic driven, or preferably an electric driven motor, and a transmission comprising a chain drive, a belt drive, a cardan drive, a gear drive or any combinations thereof, and defining a ratio of transmission from said motor to said second part.

3. The positioning assembly according to Claim 2, said transmission ratio being within the range 0.01 to 0.5, including the range 0.05 to 0.25.

4. The positioning assembly according to any of the Claims 1-3, said first operational mode of said motor-drive means generating said rotational motion being arbitrary and continuous.

5. The positioning assembly according to any of the Claims 1-4, said motor-drive means further comprising braking means to be inactive in said first operational mode and active in said second operational mode for fixating said second part relative to said first part preventing said second part from rotating relative to said first part round said axis of rotation.

6. The positioning assembly according to any of the Claims 1-4, said motor-driving means utilising in said second operational mode an inherited braking effect constituted by an initial braking torque of said motor.

7. The positioning assembly according to any of the Claims 1-6, said motor of said motor-drive means being mounted on said first part, or alternatively to said second part.

8. The positioning assembly according to any of the Claims 1-7, said first part further comprising a groove for the insertion of an corrosion and wear resisting material, such as PE, PP, PVC or any other type of plastic, as guidance for said ram head.

9. The positioning assembly according to any of the Claims 1-7, said fixation means comprising a housing defining an inner surface or surfaces to be arranged in co-planar relationship with the outer surface or surfaces of said pile.

10. The positioning assembly according to Claim 8, said housing comprising said inner surface or surfaces being substantially in co-planar relationship with said outer surface or surfaces of said pile, having an inner surface or surfaces tapering inward relative to said axis of rotation.

11. The positioning assembly according to any of the Claims 8-9, said housing comprising on said inner surface or surfaces sheets of a corrosion and wear resisting material, such as PE, PP, PVC or any other type of plastic.

5 12. The positioning assembly according to any of the Claims 1-10, said fixation means being glued, welded or preferably bolted to said second part.

10 13. The positioning assembly according to any of the Claims 1-11, said first part being arranged above said second part.

15 14. The positioning assembly according to any of the Claims 1-12, said blocking means comprising a circumferential ring protruding inwardly form said first part into said inner space thereof.

20 15. The positioning assembly according to any of the Claims 1-13, said first part being fixed to said ram mechanism.

25 16. A ram head assembly comprising:

a ram head having a top surface for receiving impact pulses produced by a ram mechanism and a bottom surface for transmitting said impact pulses to a pile preferably through an impact piece with the purpose of driving said pile into the ground or into a similar surface, a positioning assembly housing: a first part and a second part, said first part defining an inner space for receiving said ram head and exposing said top and bottom surfaces thereof and allowing said ram head to transmit said impact pulses from said ram mechanism to said pile, said first part having blocking means for preventing said ram head from being separated from said first part, said first part being fixatable to said ram mechanism, said second part being journalled rotatably relative to said first part round an axis of rotation, said axis of rotation being substantially coinciding with the longitudinal axes of said ram head and of said pile, said second part having fixation means for fixating said pile in a specific and fixed rotational relationship relative to said second part, motor-drive means co-operating with said first and second parts and having a first operational mode and a second operational mode, said motor-drive means generating in said first operational mode a rotational motion of said second part relative to said first part round said axis of rotation, and said motor-drive means generating in said second operational mode a fixation of said second

part relative to said first part preventing said second part from rotating relative to said first part round said axis of rotation.

17. The ram head assembly according to Claim 15, further having any of features of the Claims 2-14. 5

18. The ram head assembly according to any of the Claims 16 or 17, said ram head being integral with said first part. 10

19. A method for motor-driven rotation and angular fixation of a pile around longitudinal axis of said pile by means of a positioning assembly according to any of the Claims 1-14, comprising the following 15 steps,

(i) insuring said pile in said positioning assembly,

(ii) initiating said motor-drive means in said first operational mode hereby rotating said pile around said axis of rotation, and

(iii) initiating said motor-drive means in said second operational mode hereby insuring said pile in a fixed angular orientation. 25

20. A method for motor-driven rotation and angular fixation of a pile around longitudinal axis of said pile by means of a ram head assembly according to any of the Claims 15-16, comprising the following steps, 30

(iv) insuring said pile in said ram head assembly,

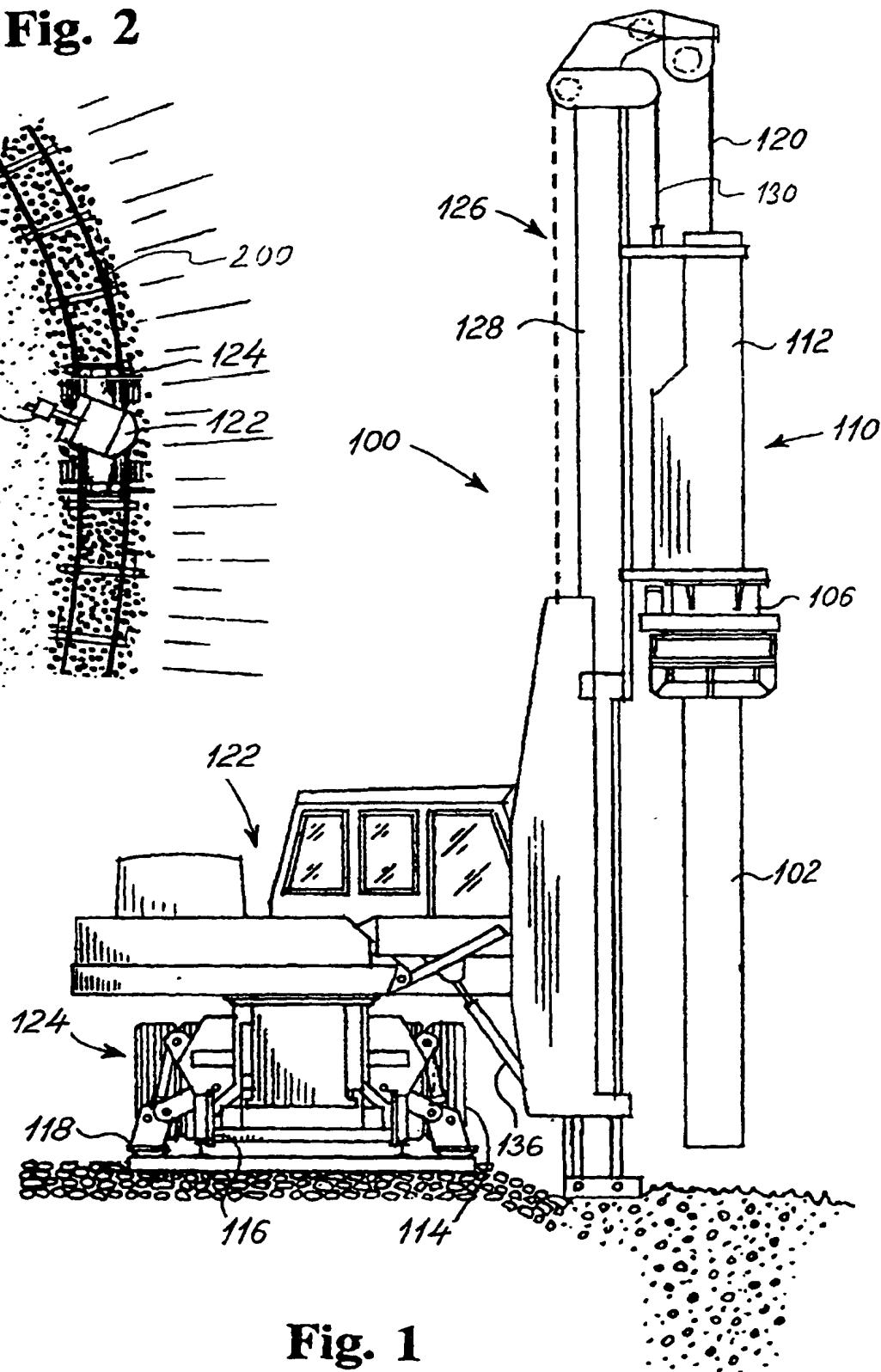
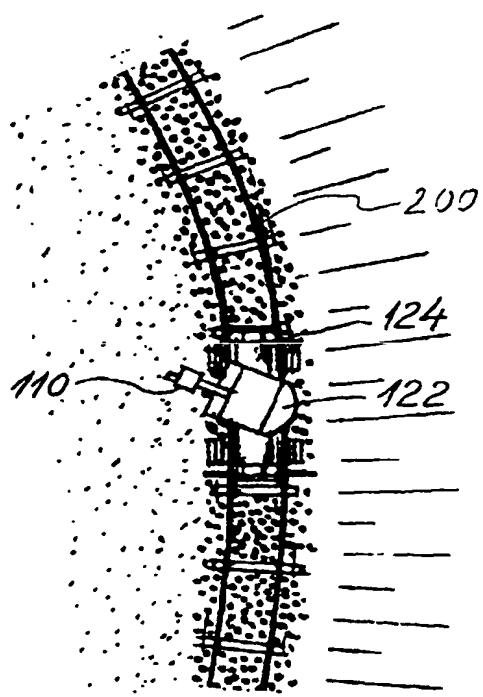
(v) initiating said motor-drive means in said first operational mode hereby rotating said pile 35 around said axis of rotation, and

(vi) initiating said motor-drive means in said second operational mode hereby insuring said pile in a fixed angular orientation. 40

45

50

55

Fig. 2**Fig. 1**

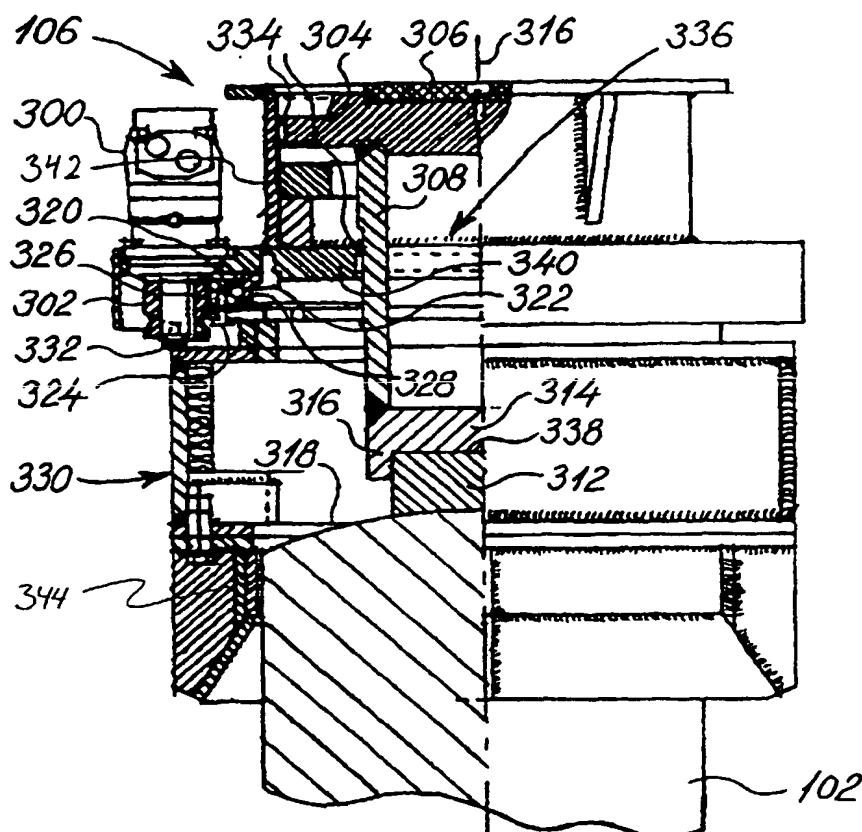


Fig. 3

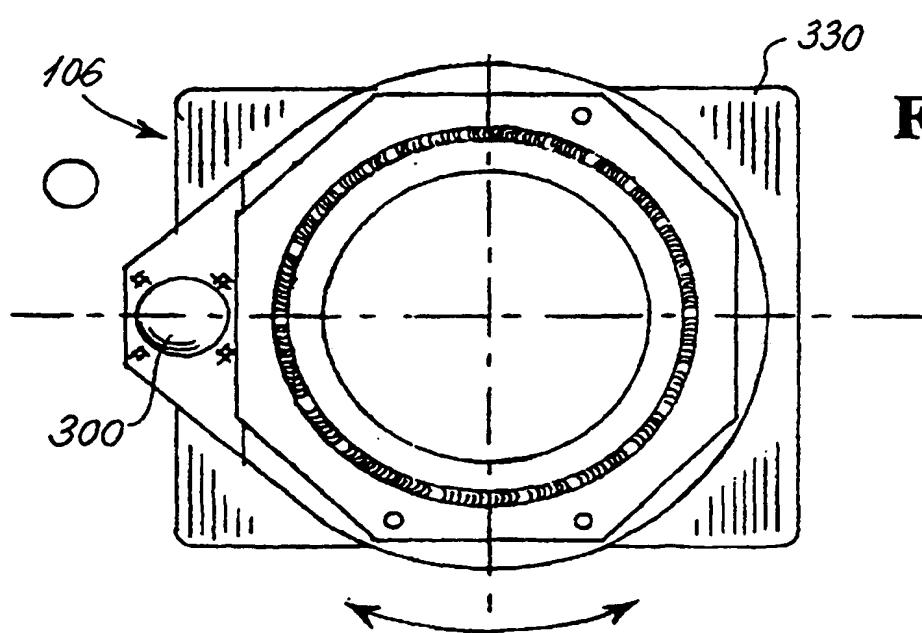


Fig. 4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 61 0031

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
D,A	EP 0 392 311 A (AARSLEFF AS) 17 October 1990 * the whole document *	1,2, 8-13, 16-20	E02D13/10
A	US 2 931 186 A (FREDERICK) 5 April 1960 * column 1, line 68 - column 3, line 14; figures 1-12 *	1,8-10, 13,16, 17,19,20	
A	US 4 479 552 A (CHAPPELOW JR CECIL C ET AL) 30 October 1984 * the whole document *	8-11	
			TECHNICAL FIELDS SEARCHED (Int.Cl.)
			E02D
<p>The present search report has been drawn up for all claims</p>			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	27 January 1999	Tellefsen, J	
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 98 61 0031

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file-on. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

27-01-1999

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
EP 0392311	A	17-10-1990	DK	173389 A	12-10-1990
			AT	109849 T	15-08-1994
			DE	69011383 D	15-09-1994
			DE	69011383 T	15-12-1994
			DK	392311 T	03-10-1994
			ES	2021567 T	01-11-1994
US 2931186	A	05-04-1960	NONE		
US 4479552	A	30-10-1984	NONE		